

Attorney's Docket No.: 10559-880001 / P17482
Intel Corporation

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Listing of Claims

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method comprising:
patterning a substrate with a substantially arbitrary arrangement of features by introducing irregularity into an array of repeating lines and spaces between the lines, wherein said introducing the irregularity comprises forming an arbitrary figure in a photoresist above the array.
2. (Currently Amended) The method of claim 1, wherein ~~introducing irregularity comprises forming an~~ the arbitrary figure comprises exposing and developing the photoresist above the array.
3. (Currently Amended) The method of claim ~~[[2]]~~ 1, wherein patterning the substrate further comprises etching a substrate through portions of the array not covered by the arbitrary figure.
4. (Original) The method of claim 1, wherein introducing irregularity comprises reducing the continuity of at least a portion of the array, the array formed using an interference lithography system.

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5. (Original) The method of claim 4, wherein reducing the continuity of the portion of the array comprises cutting spaces in the array.

6. (Original) The method of claim 1, wherein introducing irregularity comprises reducing the continuity of the portion of the array resulting from a projection lithography patterning.

7. (Original) The method of claim 1, wherein patterning the substrate further comprises etching the substrate using the substantially arbitrary arrangement to direct the etching.

8. (Original) The method of claim 1, wherein patterning the substrate further comprises patterning the substrate with the substantially arbitrary arrangement having a pitch yielding a k_1 factor smaller than or equal to 0.4.

Claims 9.-15. (Canceled)

16. (Currently Amended) A method comprising:
interfering electromagnetic radiation to illuminate a substrate with an interference pattern, the interference pattern imparting a first photoresist on the substrate with repeating lines and spaces; and
introducing irregularity into the interference pattern to impart an arbitrary feature arrangement to the substrate,

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wherein introducing irregularity comprises forming an arbitrary figure in a second photoresist above some portion of the repeating lines and spaces.

17. (Original) The method of claim 16, wherein introducing irregularity comprises ending continuity of a trench at an arbitrary position along the trench.

18. (Currently Amended) The method of claim 16, wherein ~~introducing irregularity comprises forming an~~ the arbitrary figure comprises exposing and developing the second photoresist above some the portion of the repeating lines and spaces.

19. (Currently Amended) The method of claim 16, wherein introducing irregularity comprises ~~forming~~ transferring an the arbitrary figure ~~in some~~ to the portion of the repeating lines and spaces.

20. (Currently Amended) The method of claim ~~[[17]]~~ 19, further comprises comprising patterning the substrate using the arbitrary figure to define the arbitrary feature arrangement.

21. (Original) The method of claim 16, wherein interfering electromagnetic radiation comprises imparting, to the substrate, first features having a pitch yielding a k_1 factor approaching 0.25 in a single patterning step.

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22. (Currently Amended) A method comprising:

patterning a substrate using a first lithographic technique, the patterning providing lines and spaces in a first layer with a first pitch yielding a first k_1 factor smaller than or equal to 0.5; and

~~eliminating~~ breaking the impact continuity of at least some of ~~one or more portions of~~ the lines and spaces on the substrate by printing an arbitrary figure in a photoresist layer using a second lithographic technique providing second features with a second pitch, wherein the second pitch is two or more times larger than the first pitch.

23. (Original) The method of claim 22, wherein patterning the substrate using the first lithographic technique comprises providing first lines and spaces with the first pitch yielding the first k_1 factor approaching 0.25 for a single patterning step.

24. (Original) The method of claim 22, wherein patterning the substrate using the first lithographic technique comprises patterning the substrate using interference lithography.

25. (Original) The method of claim 22, wherein eliminating the impact comprises patterning using a binary mask.

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26. (Currently Amended) The method of claim 22, wherein ~~eliminating breaking the impact continuity~~ comprises using the second lithographic technique providing second features with the second pitch yielding the second k_1 factor greater than 0.5.

27. (Currently Amended) The method of claim 22, wherein ~~eliminating the impact comprises~~ printing an arbitrary figure comprises exposing and developing the photoresist layer above some of the spaces.

28. (Currently Amended) The method of claim ~~[[27]]~~ 22, wherein ~~eliminating breaking the impact continuity~~ comprises etching a portion of the substrate not covered by the arbitrary figure.

Claims 29.-36. (Canceled)

37. (New) A method comprising:

patterning a first layer of photoresist on a substrate using interference lithography to provide a collection of periodic lines and spaces having a first pitch;

patterning a second layer of photoresist using a second lithographic technique to provide an arbitrary feature with a second pitch, wherein the second pitch is two or more times larger than the first pitch; and

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etching the substrate to transfer a superposition of the lines and spaces provided by patterning the first layer and the arbitrary feature provided by patterning the second layer to the substrate, wherein the continuity of at least one of the lines and spaces is broken in the transferred superposition.